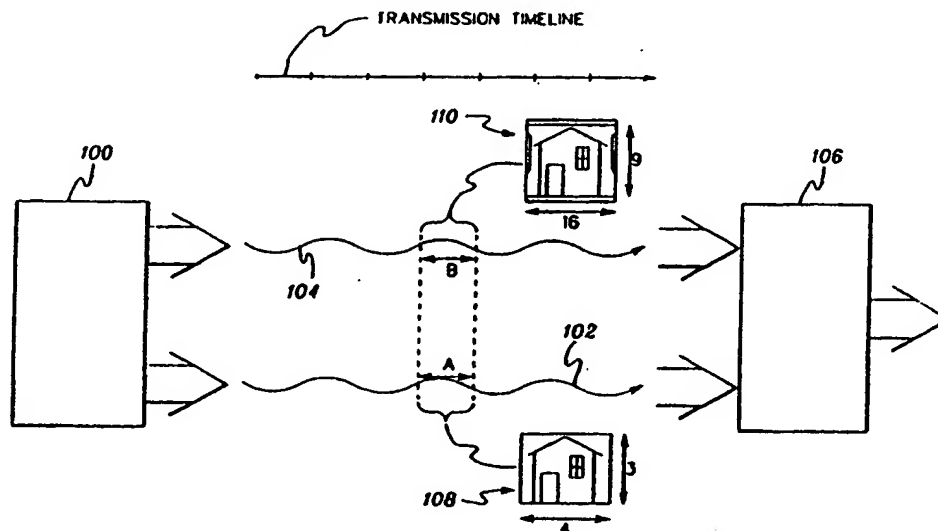


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<p>(21) International Application Number: PCT/US97/14867 (22) International Filing Date: 22 August 1997 (22.08.97) (30) Priority Data: 08/697,378 23 August 1996 (23.08.96) US (71)(72) Applicant and Inventor: GUNTRUM, Mark. F. [US/US]; 5168 Woodlawn Drive, Schenectady, NY 12303 (US). (74) Agents: REINKE, Wayne, F. et al.; Heslin & Rothenberg, P.C., 5 Columbia Circle, Albany, NY 12203-5160 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</p>

(54) Title: METHODS FOR DISTRIBUTION OF TELEVISION PROGRAMMING EVENTS



(57) Abstract

Certain advantageous purposes may be achieved through providing or making available for comparison multiple presentations of a single programming event which are provided in the same time slot. Known signal origination and distribution technologies are employed to facilitate comparative viewing of a programming event in alternative "presentation formats" (300 and 302). In general terms, this is achieved by providing synchronized or chronologically continuous presentations of a single programming event in alternative presentation formats (300 and 302) such that a television viewer can alternatively receive and view the programming event in each of the alternative presentation formats (300 and 302). The viewer may thus alternate his viewing to make a comparison between the alternative presentation formats (300 and 302), for example, by switching the reception of his receiver (304) between the channels on which the presentations are transmitted, or by viewing the alternative presentation formats together if two television receivers are available or if the viewer's receiver (304) has "picture-in-picture" capability.

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METHODS FOR DISTRIBUTION OF TELEVISION PROGRAMMING EVENTS

FIELD OF THE INVENTION

The invention pertains to the field of
5 television programming distribution.

BACKGROUND OF THE INVENTION

A variety of methods and technologies are known
for originating electrical signals which represent
the sounds and images of television programming
10 events. Prerecorded programming events stored on
storage media such as video tape, computer disk or
laser disc may be played using known production
equipment to generate signals representing the stored
programming event. Similarly, the sounds and images
15 of live programming events may be translated into
electrical signals using cameras and associated known
production equipment. Current technology offers the
ability to synchronize the origination of multiple
signals which represent the same programming event.

20 Current technology further recognizes a variety
of representation formats for representing
programming content in an electrical signal. The
protocols associated with a particular representation
format are generally dictated by the receiving
25 equipment to which the signal is being provided.
Current known representation formats include NTSC,
PAL and SECAM (standard analog formats), HDTV (a
standard high definition television format), and
MPEG2 (standard digital video encryption format).

Current technology further includes a variety of methods and technologies for distributing television programming events to television receivers. Electrical signals representing television programming events may be distributed to receivers through a variety of known distribution means which may be categorized as either broadcast transmission, wherein a signal is made available for all receivers having broadcast receiving capability, or direct transmission, where a signal is specifically provided only to selected receivers. Examples of broadcast transmission include television band broadcast, satellite broadcast, cable broadcast, and wireless cable broadcast. Examples of direct transmission included transmission over dedicated lines such as telephone lines, and direct transmission in a connectionless environment such as a client/server data distribution network.

SUMMARY OF THE INVENTION

In the television industry it is considered to be disadvantageous to present a viewer with multiple presentations of a single programming event within the same "time slot" because such multiple presentations are believed to dilute advertising revenue potential. It is therefore axiomatic in the field of television programming distribution that there are no beneficial uses of multiple presentations of a single programming event in a single time slot. For this reason, a person of ordinary skill in the field would neither use nor seek to use known production and distribution systems for the purpose of providing multiple presentations of a single programming event within the same time

slot. Moreover, multiple presentations of a single programming event during the same time slot using broadcast technology would typically require coordination between broadcasters who utilize
5 different channels within the broadcast spectrum. Such coordination is exceedingly uncommon in the realm of television programming distribution.

However, despite the clear teachings within the field to the contrary, the applicant has recognized
10 that certain advantageous purposes may be achieved through providing or making available for comparison multiple presentations of a single programming event in the same time slot. These benefits are realized through the methods which are disclosed below. The
15 invention in general terms employs known signal origination and distribution technology in a novel manner to facilitate comparative viewing of a programming event in alternative "presentation formats". In general terms, this is achieved by
20 providing synchronized or chronologically continuous presentations of a single programming event in alternative presentation formats such that a television viewer can alternately receive and view the programming event in each of the alternative
25 presentation formats. The viewer may thus alternate his viewing to make a comparison between the alternative presentation formats, for example, by alternating the channel of reception of his receiver.

The concept of a "presentation format" is one
30 which originates with the applicant. Presentation formats are to be understood as ways of presenting a programming event. More specifically, a presentation format is a manner of presenting a programming event

using a combination of presentation format variables. One example of a presentation format variable which will be used to exemplify the invention further below is the aspect ratio of the field of view. For
5 example, a feature-length cinematic production may have been originally produced using one of the many various "wide screen" cinematic aspect ratios. The production may thus be stored on video tape in a "letter box" format which reproduces the aspect ratio
10 of the original production. Alternatively, the movie may be stored in a "panned and scanned" format which reduces the aspect ratio to 4:3 (the aspect ratio of NTSC television) by omitting content at the right and/or left edges of the picture. Thus these two
15 presentations of the programming event employ alternative presentation formats which differ with respect to the aspect ratio of the field of view. A "live" programming event may similarly be originated and stored or distributed using a 16:9 aspect ratio
20 (the proposed aspect ratio for HDTV) or a 4:3 aspect ratio (the aspect ratio of NTSC television), depending upon the choice of camera and other production equipment. Other presentation format variables include color (black and white, color, or
25 "colorized"), dimensional presentation (two-dimensional or three-dimensional), and audio presentation (monophonic, stereophonic, "surround-sound," etc.). Those of ordinary skill in the field will recognize that current technology presents the
30 possibility of additional presentation format variables and that further presentation format variables will be created through advances in video and audio production technology.

DESCRIPTION OF THE DRAWINGS

The objects, advantages and features of the invention will be more readily understood from the following detailed description of certain preferred
5 embodiments of the invention, when considered in conjunction with the accompanying drawings in which:

Figure 1 depicts first and second substantially synchronized signals representing a programming event in alternative presentation
10 formats transmitted from a signal originator to a signal distributor;

Figure 2 depicts first and second substantially synchronized signals representing a programming event in alternative presentation
15 formats transmitted from a signal distributor to a television receiver over two separate channels of a common transmission medium; and

Figure 3 depicts the transmission over a single channel of a signal which alternately
20 represents a programming event in a first and then a second presentation format such that the alternative presentations are provided so as to be substantially chronologically continuous.

DETAILED DESCRIPTION OF THE INVENTION

I. DEFINITIONS

A number of terms used herein to disclose and define the invention are terms which are new to the field or which have been assigned a specific meaning in the context of the invention which may not accord with the meaning commonly attributed to the term in the field. Accordingly, the following terms are used to disclose and define the subject matter of the invention and are intended to be understood in accordance with the definitions which follow:

PROGRAMMING EVENT: A programming event is a collection of images and sounds associated with an occurrence.

PRESENTATION FORMAT: A presentation format is a manner of presenting a programming event to a viewer which is determined by a combination of presentation format variables.

PRESENTATION FORMAT VARIABLE: A presentation format variable is an aspect of a presentation format which may be varied to take one of alternative forms. The specific value of a presentation format variable in a given presentation of a programming event is determined by the equipment and processes used to translate the sounds and images of the programming event into an electrical signal, the equipment and processes used to store the signal, and/or the equipment and processes used to originate the signal for distribution.

Examples of presentation format variables include aspect ratio, color (black and white, color, tinted, or "colorized"), dimensional presentation (two-dimensional or three-dimensional) and audio presentation (monophonic, stereophonic, "surround sound," etc.).

10 **SIGNAL ORIGINATOR:** A signal originator is a combination of devices and associated processes used to generate signals for distribution to receivers.

SIGNAL DISTRIBUTOR: A signal distributor is a combination of devices and associated processes used to distribute signals over a transmission medium to receivers.

15 **SUBSTANTIALLY SYNCHRONIZED:** Multiple presentations of a programming event are substantially synchronized when a given point within the programming event is represented in each of the multiple presentations at the same
20 time, such that a meaningful comparison may be made between the portions of the programming event surrounding that point in each of the multiple presentations when the presentations are viewed alternately or simultaneously. In
25 the case of programming events stored on a recording medium, substantial synchronization may be achieved through reference to time codes associated with the presentation, such that the presentations may be commenced from the same
30 point at the same time and presented at equal speeds. It will be recognized by those of ordinary skill in the art that the

synchronization produced through this and other known methods may not be exact, but rather will be approximate within a range dictated by known and quantifiable variables. In the case of multiple presentations of a live programming event, the presentations would by nature be considered substantially synchronized absent the introduction of atypical delay into one or both of the signals.

SUBSTANTIALLY CHRONOLOGICALLY CONTINUOUS: Where a receiver receives a first signal presenting a programming event in a first presentation format, and then a second signal presenting the same programming event in a second presentation format, the presentation in the second presentation format is considered to be substantially chronologically continuous with the presentation in the first presentation format where the portion of the programming event represented by the second signal follows chronologically the portion of the programming event represented by the first signal such that the chronological shift between the portions represented by the respective signals is insubstantial, allowing a meaningful comparison to be made between the presentation formats of each presentation.

TELEVISION RECEIVER: The term "television receiver" is broadly used to encompass known equipment for receiving signals representative of programming events transmitted to the receiver from a remote point of origin and for facilitating the display of the programming

event represented by the received signal. A television receiver may for example comprise a standard NTSC television, a personal computer, or a set top processor used as an interface for receiving and translating incoming signals (commonly referred to as a "set top box"). Television receivers are characterized by a user interface through which a user controls the display of programming events.

REPRESENTATION FORMAT: A representation format is a standardized signal and/or storage format for representing programming content. A representation format may produce an analog representation, such as the existing NTSC, SECAM and PAL formats, or a digital representation such as the HDTV or MPEG2 formats.

CHANNEL: The term "channel" is broadly used to describe one of alternative carrier wave bands within a broadcast spectrum which is recognized by a television receiver as a band which is designated for conveying single programming events.

II. ORIGATION AND DISTRIBUTION OF SIGNALS IN ACCORDANCE WITH THE INVENTION

Figure 1 illustrates a first example of a method embodying the invention in which a signal originator provides television programming signals to a signal distributor 106 for distribution to television viewers. In this example, the signal originator 100 originates first 102 and second 104 continuous signals which each represent the same programming event. The signal originator may be a combination of equipment and processes used by a single entity such as a television broadcasting company to produce the two illustrated signals. Alternatively, the signal originator may be the combination of equipment and processes used by two separate entities such as two independent television broadcasting companies which together result in the production of the two illustrated signals.

The signals 102 and 104 are provided to the distributor 106 in the same representation format, which may for example be NTSC, PAL, SECAM, HDTV, or MPEG2. The signals may be originated from prerecorded sources such as video tape or laser disc, or from cameras if the programming event is occurring live. The first signal 102 and the second signal 104 both represent the same programming event but present the programming event in alternative presentation formats.

In the illustrated example, the first signal presents the programming event with a field of view 108 having a 4:3 aspect ratio, while the second signal presents the programming event with a field of

view 110 having an aspect ratio of 16:9. Further, the presentations are substantially synchronized. Specifically, by comparing the image represented by a portion A of the first signal and a portion B of the second signal, where each portion exists at the same period along a programming event transmission time line, it is seen that the portions of the programming event represented by portions A and B are essentially the same. Thus the two presentations are substantially synchronized.

In the case of a prerecorded programming event, substantial synchronization may be achieved through reference to time codes which are included in the representation format. In the case of a live programming event, it is expected that multiple presentations will by default be substantially synchronized absent the introduction of significant delay into one or both of the signals.

Figure 2 illustrates a second example of a method embodying the invention in which a signal distributor 106 provides television programming signals to a television receiver 200 at a remote location for viewing by a television viewer. In this example, the signal distributor 106 provides first 202 and second 204 continuous signals which each represent the same programming event. The signal distributor 106 may for example be a television broadcast tower, a cable head end, or a broadcast satellite.

The illustrated signals 202 and 204 are provided in the same representation format, which may for example be NTSC, SECAM, PAL, HDTV, or MPEG2. The

signals may simply be relayed from a signal originator as described above. Alternatively, the signal distributor 106 may also perform the function of signal originator, in which case the signals may
5 be provided from prerecorded sources such as video tape or laser disc, or from cameras if the event is occurring live.

The first signal and the second signal represent the same programming event but present the
10 programming event in alternative presentation formats. In the illustrated example, the first signal presents the programming event with a field of view 206 having a 4:3 aspect ratio, while the second signal presents the programming event with a field of
15 view 208 having an aspect ratio of 16:9. Further, the presentations are substantially synchronized. Specifically, by comparing the image represented by a portion A of the first signal and a portion B of the second signal, where each portion exists at the same
20 period along the programming event transmission time line, it is seen that the portions of the programming event represented by portions A and B are essentially the same. Thus the two presentations are substantially synchronized.

25 In the case of a prerecorded programming event, substantial synchronization may be achieved through reference to time codes which are included in the representation format. In the case of a live programming event, it is expected that multiple
30 presentations will by default be substantially synchronized absent the introduction of significant delay into one or both of the signals.

Moreover, the signals of Figure 2 are provided on different channels 210 and 212 of a common communication medium 214. The communication medium could be the television broadcast band, the satellite broadcast band, a cable broadcast system, a wireless cable broadcast system, or another similar medium. By being provided on different channels of a common medium, the signals may be received and decoded by a television receiver having the capability of receiving and decoding signals provided through that medium.

Figure 3 illustrates a third example of a method embodying the invention involving a direct signal distributor 106 such as an interactive cable provider or a computer data server. In this example, the signal distributor 106 must be capable of providing a first signal 300 and a second signal 302 which each represent a programming event. However, because the distribution is direct, only one of the signals needs to be provided to the receiver 304 at a time.

The signals 300 and 302 may be in either analog or digital form, using any of the many known presentation formats such as NTSC, PAL, SECAM, HDTV or MPEG2. The signals may simply be relayed from a signal originator as described above. Alternatively, the signal distributor may also act as signal originator, in which case the signals may be provided from prerecorded sources such as video tape or laser disc, or from cameras if the event is occurring live.

The signal distributor 106 initially provides a first signal 300 representative of the programming event in a first presentation format. However, responsive to a receiver command to provide alternate programming, the signal distributor 106 substitutes for the first signal 300 a second signal 302 which presents the programming event in a second presentation format. The signal 302 representing the programming event in the second presentation format is provided in such a manner that the presentation of the first signal and the presentation of the second signal are substantially chronologically continuous.

In the illustrated example, the first signal presents the programming event with a field of view having a 4:3 aspect ratio, while the second signal presents the programming event with a field of view having an aspect ratio of 16:9. Further, the presentations are substantially chronologically continuous. Specifically, by comparing the image represented by a portion A of the first signal and a portion B of the second signal, where portion B follows portion A along the programming event transmission time line, it is seen that the portions of the programming event represented by portions A and B are essentially the same. Thus the two presentations are substantially chronologically continuous.

Where the signal distributor produces two substantially synchronized signals representing the programming event in two alternative presentation formats but only distributes one at a time in accordance with a viewer selection, a change from one signal to the other will provide a substantially

chronologically continuous presentation unless
substantial delay is introduced. Thus, in the case
of a prerecorded programming event, substantial
chronological continuity may be achieved through
5 reference to the time codes which are included in the
representation format. In the case of a live
programming event, it is expected that multiple
presentations will by default be substantially
chronologically continuous absent the introduction of
10 substantial delay into one or both of the signals.

III. EXEMPLARY EMBODIMENTS OF THE INVENTION

The invention in general terms involves providing substantially synchronized or substantially chronologically continuous presentations of a single programming event in alternative presentation formats such that a television viewer can alternately view the programming event in each of the alternative presentation formats, such as by switching the channel of reception of his receiver. The invention may be employed to facilitate contemporaneous reception and comparative viewing of a wide range of alternative presentation formats, and may be practiced in association with various known production techniques to illustrate the comparative ability of various presentation formats to enhance the range of production options made available by each presentation format. The following examples illustrate various manners in which the invention may be practiced.

Example 1: The programming event is a cinematic production. A first version of the programming event is stored on video tape in an NTSC "letter box" presentation format which preserves the 2.35:1 "Cinemascope" aspect ratio of the original production. A second version of the programming event is stored on video tape in a "panned and scanned" NTSC presentation format which limits the aspect ratio to 4:3 (1.33:1) by omitting content from the right and/or left edges of the original field of view. First and second signals are originated by playing the two versions of the programming event simultaneously and substantially in synchronization using known devices and methods. The resulting

signals are routed through standard production and transmission equipment to broadcast transmitters which transmit on different channels within the television broadcast band. The two alternative
5 presentations of the programming event are therefore receivable on a standard NTSC television receiver. A viewer using the receiver may view each presentation of the programming event alternately by switching the reception of his receiver between the channels on
10 which the presentations are transmitted, or may view the alternative presentation formats together if two television receivers are available or if the viewer's receiver has "picture-in-picture" capability.

Example 2: The programming event is a live
15 ice hockey game. A single camera positioned above and to the side of the playing surface at approximately center ice follows the play from side to side and captures the event in a 16:9 aspect ratio format. Standard production equipment processes the
20 signal from the camera to originate a first signal in an NTSC "letter box" format which preserves the 16:9 aspect ratio of the field of view. A second signal in a 4:3 NTSC format is originated by omitting content from the right and/or left edges of the
25 original 16:9 field of view. The two signals are routed through standard production and transmission equipment to a cable systems operator who distributes each of the signals on separate standard cable television channels in NTSC format. The two
30 alternative presentations of the hockey game are therefore receivable by a standard cable-ready NTSC television receiver or a standard cable reception decoder box. A viewer using such receiving equipment may view each presentation of the game alternately by

switching between the two channels, thus comparing the respective fields of view provided by the 4:3 and 16:9 aspect ratios.

Example 3: The programming event is a live
5 baseball game. A first camera captures the event from behind the pitcher such that the pitcher, catcher, and batter are visible. A second camera captures the event from the side of the field near first base looking towards second base and will
10 follow the motion of a base runner on first base who is expected to attempt to steal second base. The first and second cameras capture the event in a 4:3 aspect ratio and the signals from the cameras are combined using known production techniques to
15 originate a traditional "split-screen" view showing both the pitcher and the base runner. A third camera captures the event from the side of the field at a point midway between first base and the outfield wall. The third camera captures the event in a 16:9
20 aspect ratio which allows the pitcher, batter, catcher, base runner, and first and second bases to be shown across the width of the field of view. The signal from the third camera is processed using known production equipment such that a signal is originated
25 which provides a "letter box" presentation containing the entire field of view captured by the third camera. First and second signals representing the "split-screen" and "letter box" views are routed through standard production and transmission
30 equipment to a cable systems operator who distributes each of the signals on separate standard cable television channels. The two alternative presentations of the game are therefore receivable on a standard NTSC television receiver. A viewer using

the receiver may view each alternative presentation of the programming event alternately by switching between the two channels, thus comparing the respective fields of view provided by the 4:3 and 16:9 aspect ratios and the enhanced production options facilitated by the 16:9 aspect ratio. In this example, the aspect ratio is a presentation format variable which serves to define alternative presentation formats. However, for purposes of defining the nature of the present invention, the use of different cameras having different vantage points is considered to be a production variable, rather than a presentation variable. For purposes of the invention, the distinction is that the different camera angles represents ones of a continual stream of aesthetic choices as to how the programming event will be portrayed, whereas the presentation format is a static manner of presenting the sounds and images chosen in the course of production.

Example 4: Several broadcasters are presenting a Presidential debate for which several 30 second "commercial breaks" have been scheduled at predetermined times. Because the debate is a live event, the commercial breaks taken by each broadcaster will be substantially synchronized. An advertiser provides a 30 second commercial advertisement to two broadcasters who are presenting the debate in the same representation format, for example, NTSC. The commercial advertisement is the programming event. The version of the advertisement given to a first broadcaster presents the advertisement in color in a 16:9 "letterbox format" with stereo surround sound. The version of the advertisement given to a second broadcaster presents

the advertisement in black and white in a 4:3 aspect ratio with monophonic sound. Each broadcaster presents the advertisement during the same commercial break. The two alternative presentations of the advertisement are therefore receivable by receivers capable of receiving the broadcaster's respective signals. A viewer may view each of the advertisements alternately by switching between the channels of each broadcaster, thus comparing the respective fields of view provided by the 4:3 and 16:9 aspect ratios, the differences in sound quality, and the contrast between a color picture and a black and white picture.

While the examples and illustrations described above represent the best modes presently known to the inventor for carrying out the invention, the invention is capable of a variety of alternative embodiments. Those of ordinary skill in the art will be aware of other embodiments which may be employed without departing from the scope of the invention as defined in the following claims.

CLAIMS

What is claimed is:

1. A method for providing a television programming event for distribution to a television receiver comprising:

5 originating a first signal representative of a first presentation of the programming event in a first presentation format;

 originating a second signal representative of a second presentation of the programming event in a second presentation format; and

10 providing the first signal and the second signal in the same representation format and such that the first and second presentations of the programming event represented by the first and second signals are substantially synchronized.

2. A method for providing a television programming event to a television receiver comprising:

5 distributing a first signal representative of a first presentation of the programming event in a first presentation format to a television receiver; and

10 distributing a second signal representative of a second presentation of the programming event in a second presentation format to said television receiver;

the first signal and the second signal being distributed in the same representation format;

15 the first signal and the second signal being distributed to said television receiver through a common transmission medium and being further distributed such that the first and second presentations of the programming event represented by the first and second signals are substantially synchronized.

3. The method of claim 2, wherein the first signal is distributed on a first channel receivable by said television receiver, and the second transmission signal is distributed on a second channel receivable
5 by said television receiver.

4. A method for providing a television programming event to a television receiver comprising:

5 distributing a first signal representative of a first presentation of the programming event in a first presentation format;

receiving a signal representative of a viewer command to provide alternate programming; and

10 responsive to said signal, distributing a second signal representative of a second presentation of the programming event in a second presentation format such that the presentation of the programming event represented by the second signal is substantially chronologically continuous with the presentation of the programming event represented by the first
15 signal.

5. A method for providing a television programming event to a television receiver comprising:

distributing to a receiver a first signal representative of a first presentation of a programming event in a first presentation format to a television receiver, said first signal being distributed in the same representation format as a second signal being simultaneously receivable by said television receiver and representative of a second presentation of the programming event presented in a second presentation format, said first signal being distributed such that said first and second presentations of the programming event represented by said first and second signals are substantially synchronized.

6. The method of claim 5, said distributing comprising distributing said first signal over a transmission medium common with said second signal.

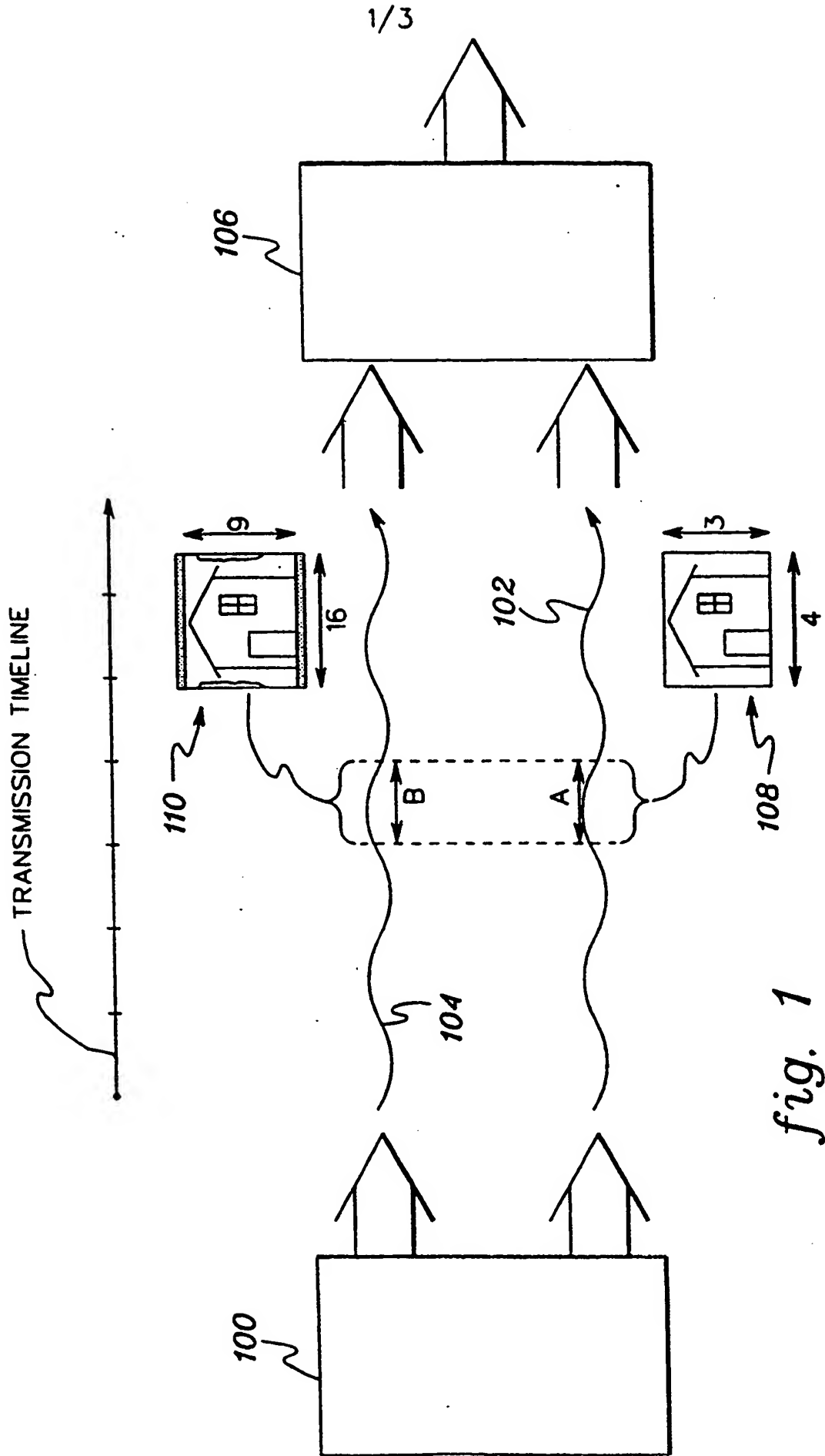


fig. 1

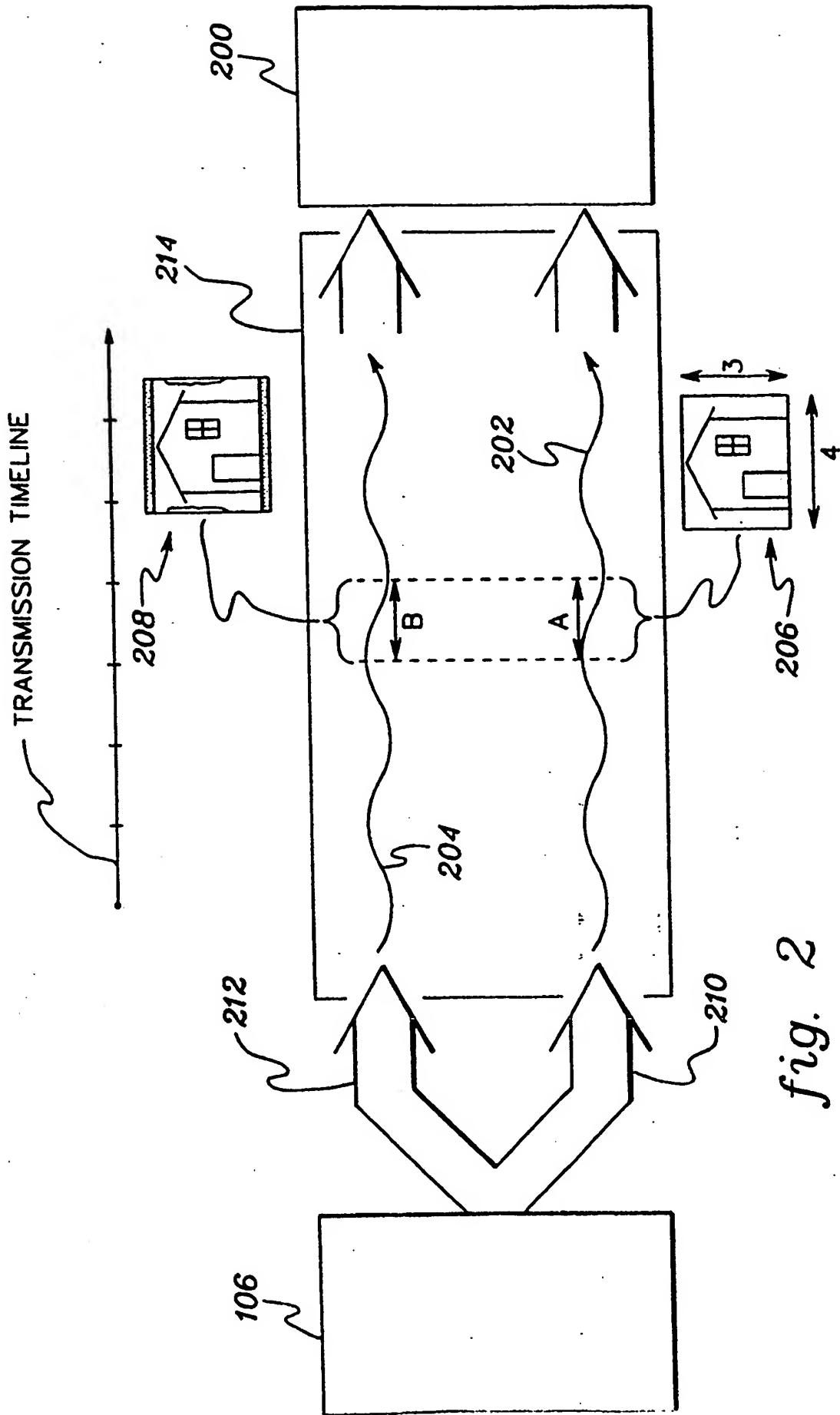


fig. 2

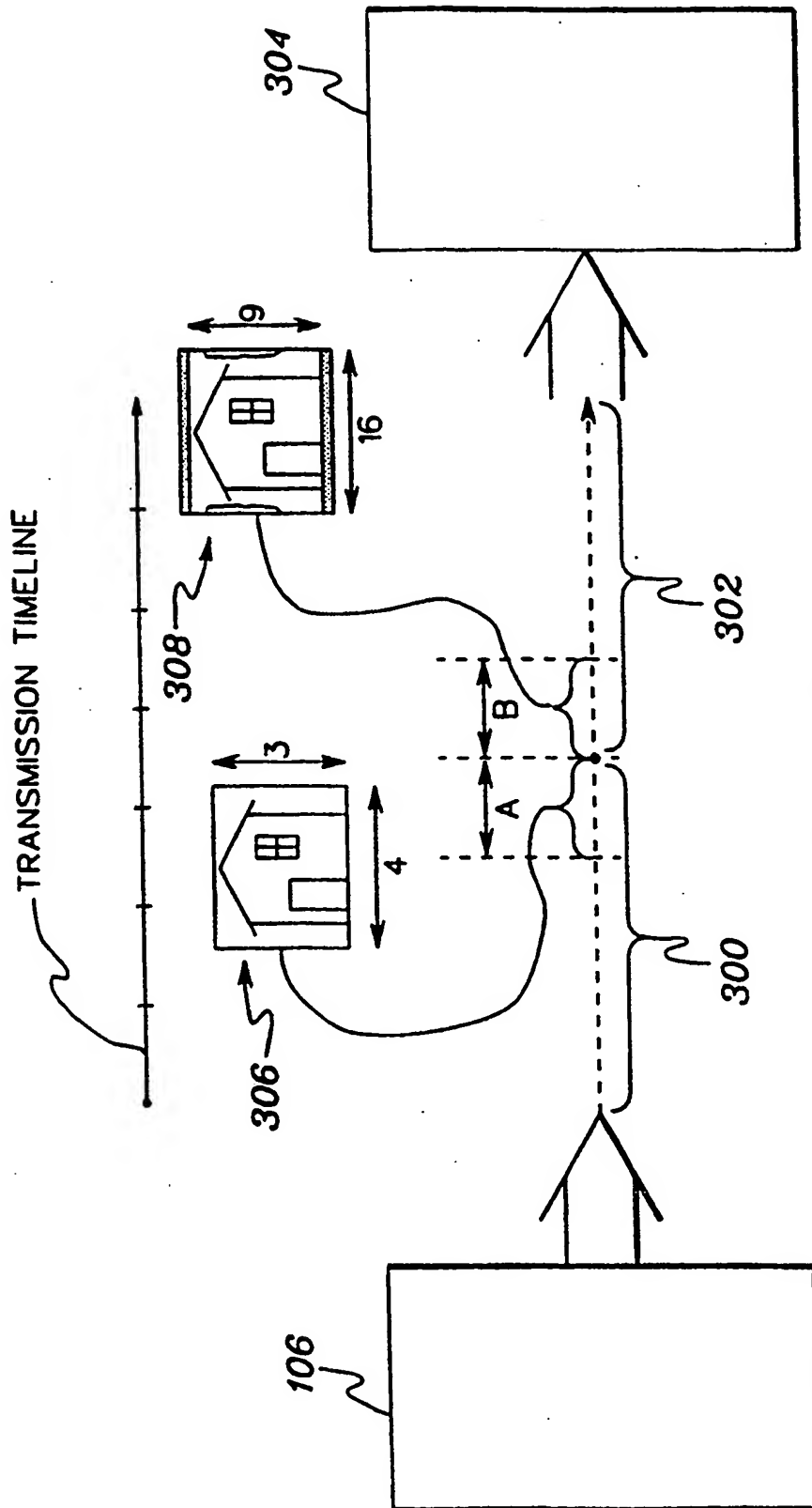


fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US97/14867

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : HO4N 7/12, 11/02, 11/04, 5/46, 7/01, 11/20, 7/10, 7/14

US CL : 348/6, 7, 12, 13, 385, 388, 426, 443, 445, 449, 454, 555, 556

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 348/6, 7, 12, 13, 385, 388, 426, 443, 445, 449, 454, 555, 556

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS - aspect ratio, hdtv, ntsc, pal, letterbox, VOD, interactive, on-demand, multi-signals, multi-format, user, viewer, subscriber, choice?, selections, preferences, demands, requests

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,231,494 A (WACHOB) 27 June 1993, col. 1, lines 54-68, col. 2, lines 1-35, col. 3, lines 45-62, fig 2.	1,2,3,5,6
Y		4
Y,P	US 5,631,693 A (WUNDERLICH et al), 20 May 1997, col. 3, lines 11-46	4

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	* I* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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